

## **REMARKS**

The Final Office Action of September 21, 2007 has been received and its contents carefully considered. Reconsideration is respectfully requested in view of the amendments above and the following comments.

Claims 1-8, 10-13, and 16-24 were cancelled without prejudice in the previous Submission of January 29, 1007. Claims 9, 14 and 15 were cancelled in the previous Amendment of August 30, 2006. Claims 30 and 35 were cancelled, and their subject matter incorporated into independent claim 25, in the amendment of August 15, 2007. Claim 47 was added, incorporating the subject matter of claims 27, 32 and 36, in the Amendment of August 15, 2007.

Claim 27 is being cancelled herein, and its subject matter incorporated into independent claim 25. Claim 25, 28, 36 and 47 have been amended herein. No new matter has been added.

Claims 25, 26, 28, 29, 31-34 and 36-47 are currently pending in the instant application.

### **I. Objections to the Claims**

Claim 47 has been objected to for being improperly dependent from independent claim 25. In response, claim 47 have been amended herein to properly depend from claim 26 as suggested by the Examiner.

**II. Rejection under 35 USC 102(b)**

Claims 25, 26, 29, 33, 34, 42-45 were rejected under Section 102(b) as being anticipated by Yamauchi et al.

The Section 102(b) rejection of the claims has been mooted by virtue of the incorporation into independent claim 25, from which claims 26, 29, 33, 34, and 42-45 directly or indirectly depend, of the subject matter of claim 27.

In view of the above, it is submitted that independent claim 25 is patentable over Yamauchi et al. It is further submitted that dependent claims 26, 29, 33, 34, 42-45 are patentable over Yamauchi et al. for being dependent from independent claim 25, and further for the particular additional features that they recite.

Accordingly, the Examiner is respectfully requested to reconsider and withdraw her rejection of the claims under Section 102(b).

**III. Rejection under 35 USC 103(a)**

Claim 31 has been rejected under Section 103(a) as being unpatentable over Yamauchi et al. as applied to claim 25, and further in view of Watts et al.

Claims 37-39 have been rejected under Section 103(a) as being unpatentable over Yamauchi et al. as applied to claim 25, and further in view of Acklin et al.

Claim 40 has been rejected under Section 103(a) as being unpatentable over Yamauchi et al. as applied to claim 25, and further in view of Rosenberg et al.

Claim 41 has been rejected under Section 103(a) as being unpatentable over Yamauchi et al. as applied to claim 25.

Claims 32, 36, 46 and 47 have been rejected under Section 103(a) as being unpatentable over Yamauchi et al. as applied to claim 25, and further in view of Stewart et al.

Claim 27 and 28 have been rejected under Section 103(a) as being unpatentable over Yamauchi et al. as applied to claim 25, and further in view of Malone et al.

Reconsideration is respectfully requested in view of the following comments.

To the extent that the subject matter of claim 27 has been incorporated into independent claim 25, from which all of the other pending claims depend, the rejection under Section 103(a) over Yamauchi et al. in view of Malone et al. will be discussed first.

Independent claim 25 as amended recites "a laser light control device disposed on the upper portion of the stepped surface of the substrate, the electrical connection electrically coupling the laser light control device to the laser light source." The Examiner acknowledges that Yamauchi et al. do not disclose placing their control circuit 21 inside the module 20 (see Yamauchi et al.'s Fig. 5A). However, the Examiner states that modifying Yamauchi et al. to place the control circuit 21 inside the module 20 would have been obvious because: (1) longer wires introduce noise and instability into the system, and a person of ordinary skill would have been motivated to place control circuit 21 closer to the laser "and reduce noise associated with long wires"; (2) it is always desirable to place electrical components as close together as possible; and (3) Malone et al. provide evidence of placing a laser driver inside an optical package. The above reasons will be addressed seriatim below.

With respect to the Examiner's reason (1) above, it fails to take into consideration the important fact that the very purpose of Yamauchi et al. would be destroyed if it were in fact to be modified as suggested in the outstanding Office Action. A main purpose in Y et al. is to ensure an avoidance of an erroneous operation of the wavelength locker (which includes the temperature regulation block 3 and the components provided thereon) by balancing any temperature differences that may tend to occur between the optical filter 6 and the laser driver 1. See Y et al.'s paragraph [0017] and Fig. 1. Such errors may occur, for example, when the temperature of the optical filter 6 may have changed as a result of the temperature of the environment in which the module 10 is positioned. In such a case, the control circuit may erroneously judge the temperature of the laser diode 1 as having changed as well, and may activate the temperature regulation block 3 so as to change the temperature of the laser diode 1. See Y et al.'s paragraph [0021].

In order to alleviate the above problem, Y et al. propose to mechanically and thermally couple the laser driver 1 (See Y et al.'s Figs. 5A and 5B) to the package body 2 by way of a number of bonding wires 9. See Y et al.'s paragraph [0048]. The bonding wires are provided to establish an intentional thermal coupling between the laser diode 1 and the environment in which the optical semiconductor module 20 is used. Laser driver 1 is typically temperature controlled by a control circuit, while the optical filter 6 is not. Thus, changes in the temperature of the environment would normally (i.e. without the bonding wires 9) affect the laser driver 1 differently from the optical filter 6. Bonding wires 9 are thus provided to establish a balance between the laser driver 1 and the optical filter 6 in terms of the manner in which the temperature

of the environment affects each of those elements. See Y et al.'s paragraph [0059]. Bonding wires 9 essentially couple the temperature of the environment to the laser driver 1.

Considering the above, if Y et al. were to be modified as suggested by the Examiner for the circuit control 21 to be brought into the module 20, doing so would destroy the very purpose of temperature balancing between the laser driver 1 and the optical filter 6. The above holds true at least because the circuit control 21 would generate its own temperature variations at the very interior of the module 20 based on its location. In such a case, while the bonding wires 9 would do their very best to couple environmental temperature to the laser driver 1, no amount of temperature transfer by those bonding wires 9 would even begin to address the additional temperature variations/disturbances to the system brought about by a control circuit disposed within the module itself. A control circuit disposed within Y et al.'s module would at best create its own temperature disturbances with respect to how it would differently affect each of the laser driver 1 and the optical filter 6, which temperature differences would create the very same problems (and perhaps even worse problems) attempted to be addressed by Y et al. (in a configuration where the control system is disposed outside of the module) without those problems however having any means of being addressed. Thus, whether reducing noise may be a noble cause in designing optical modules, having an optical module that actually functions, it is submitted, would offer a more pressing cause in the first instance.

Regarding the Examiner's reason (2) that "it is always desirable to place the electrical components as close together as possible," it is submitted that one cannot

make such a blanket statement without a reasonable consideration of all of the factors affecting the design of a microelectronic device. In the particular case of the module disclosed in Y et al., clearly, and as explained in detail in the paragraphs above, placing the circuit control 21 of Y et al. inside the module 20 would kill the very purpose of Y et al.

Malone et al. has been cited for "provid[ing] evidence of placing laser driver inside the optical package." The "evidence" in Malone et al. referred to by the Examiner consists of a reference at column 22, lines 45 to 57 to the fact that a cavity 73 extending inwardly from the top surface 12 of optical sub-assembly (OSA) 130 of Figs. 25-27 may be large enough to include additional semi-conductor and electronic components such as laser diode drivers. Although Malone et al. may teach placing a laser driver onto a OSA module substrate, their teaching is wholly inapplicable to Y et al., and, further, they do nothing to overcome the deficiencies of Y et al. in the first instance.

Malone et al.'s OSA 130 includes an open space 132 into which various optical components may be placed. The open space 132 is open to the environment. At least to that extent, Malone et al. do not have the same concerns as noted above in the case of Y et al. with respect to regulating the temperature within an enclosure in which the laser driver and associated optical arrangement is contained. See Y et al.'s paragraph [0065]. Malone et al. can relatively freely place heat generating components into the cavity 73, because the cavity is associated with an open space 132. In the case of Y et al., however, placing a control circuit inside the module 20

could prove disastrous. Thus, a person of ordinary skill would not be motivated to use Malone et al. as "evidence" for modifying Y et al. as suggested by the Examiner.

In view of the above, it is submitted that independent claim 25 is patentable over Y et al. in view of Malone et al. Claims 25, 26, 28, 29, 33, 34 and 42-45 are further patentable over Y et al. in view of Malone et al. by virtue of their dependency from claim 25, and further for the particular additional features that they recite.

Watts et al., Acklin et al., Rosenberg et al., and Stewart et al. have been used in combination with Y et al. in rejecting claims 37-39, 40, 41 and 32, 36, 46 and 47, respectively. Neither Watts et al., nor Acklin et al., nor Rosenberg et al. nor Stewart et al. do anything to overcome the deficiencies of Y et al., or of Y et al. in view of Malone et al., as noted above. Thus, claims 32, 36-41, 46 and 47 are likewise patentable over the cited combination of references by virtue of depending from independent claim 25, and further for the particular additional features that they recite.

In view of the above, the Examiner is respectfully requested to reconsider and withdraw her rejections of the claims under Section 103(a).

## CONCLUSION

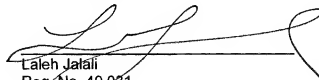
In view of the foregoing, Applicant respectfully submits that the present application is now in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call the undersigned attorney at (703) 633-0944.

Please charge Deposit Account No. 50-0221 for any shortage of fees in connection with this response.

Respectfully submitted,

Intel Americas

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